



*Integrated
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September 14, 2000

Ms. Sheri P. Cresswell
United States Environmental Protection Agency, Region IV
301 Ridge Creek Drive
Lexington, SC 29072

SITE Medley Farm
BREAK 8.6
OTHER V3

Subject: Response to Comments and Revisions to the Five-Year Report
Medley Farm Site Remedial Action, Gaffney, South Carolina

Dear Ms. Cresswell:

Since the Medley Farm Site annual meeting held on April 20, 2000, the three new dual-phase groundwater recovery wells and one new soil vapor extraction (SVE) well have been installed, as approved by the United States Environmental Protection Agency (USEPA) and the South Carolina Department of Health and Environmental Control (SC DHEC). The modifications to the treatment system design have been completed. We anticipate mobilizing contractors to the Site by October to make the necessary system modifications. Startup of groundwater recovery from the new wells is planned to occur in November. In addition, the "limited" backhoe investigation of affected soils identified from 5 to 7 feet below ground surface at the PSVB 2-1 location is scheduled to occur in conjunction with treatment system modifications.

On behalf of the Medley Farm Site Steering Committee, RMT, Inc. (RMT) is pleased to submit responses to comments received from USEPA and SC DHEC reviewers and provide revised pages to the Five-Year Report as discussed at our April 20, 2000, annual meeting. During the April 20, 2000, annual meeting the following issues were discussed and agreed upon.

Four Volatile Organic Compounds of Concern

Over the course of reviewing analytical data and annual report preparation for the Medley Farm Site, four volatile organic compounds (VOCs) have been most frequently detected. These compounds referred to as the "4 VOCs of Concern," are 1,1-dichloroethene (1,1-DCE), tetrachloroethene (PCE), 1,2-dichloroethane (1,2-DCA), and trichloroethene (TCE). The phrase "VOCs of Concern" is not Record of Decision (ROD)-based and use of the phrase is not intended to imply that these are the only VOCs detected in groundwater. RMT recognized other compounds, pursuant to the established parameter list, as being a concern. RMT has clarified this in the revised pages to the Five-Year Report.

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Assessing Groundwater Quality in Proximity to Monitor Well SW-3

Due to the effects of groundwater recovery from the A-series recovery wells, the area around monitoring well SW-3 appears to be in a stagnation zone. However, with the addition of the new recovery wells in 2000, the stagnation areas will most likely change. In the 2000 Annual Report, RMT will revise and recalibrate the groundwater model to account for predicted responses that would be expected from these additional pumping wells. Currently, RMT does not believe that the addition of a deep monitor well in this area is warranted. After the startup of the three new groundwater recovery wells, RMT will re-evaluate groundwater conditions at the site and report this information to the USEPA and SC DHEC.

Monitoring Frequency at the B-Series Recovery Wells

With the addition of the new groundwater recovery wells, changes to treatment system efficiency and improved recovery of contaminants from B-series wells is anticipated. During preparation of the 2000 Annual Report, RMT will consider the need for monitoring improvements along the B-series wells.

Additional Monitoring Wells along Eastern Boundary of the Site

At this time, RMT does not believe that the installation of additional monitoring wells along the eastern boundary of the site is warranted. Below, several factors are compiled that support this conclusion:

- RMT has defined the downgradient extent of the VOC plume using clean wells along the northeast and southeast boundaries.
- Due to site relief and thick vegetation, obtaining access for drilling locations in this area would be extremely difficult, if not impracticable.
- Due to the northeast trending fault, groundwater capture does not extend significantly to the east.
- The VOC plume is presently contained on-site and no downgradient human receptors have been identified.

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Following startup of the three new recovery wells, RMT will be revising and recalibrating the groundwater model to account for predicted water level responses that should be observed with the additional pumping wells. During the 2000 Annual Report, RMT will re-evaluate groundwater conditions at the site and consider further refinements and improvements to the monitoring network.

Revisions have been made to the Five-Year Report in accordance with the written comments received from USEPA and SC DHEC and as discussed at our April 20, 2000 meeting. Enclosed, you will find four copies of the revised pages, for insertion into your copies of the report.

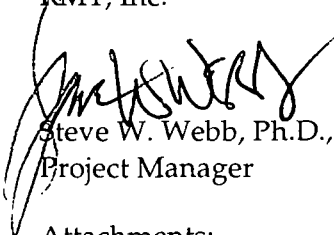
Please insert/replace the pages in the report as follows:

1. Replace Subsection 1.1 (page 1-1) with the enclosed page. The confirmation "by SC DHEC" was added for accuracy and the text regarding the use of the term "VOCs of concern" was clarified.
2. Replace Figure 5-4 (page 5-10) with the enclosed figure. The legend was corrected to show groundwater capture after one and two years of system operation.
3. Replace Subsection 6.1, Subsection 6.1.3 (pages 6-4 and 6-5) with the enclosed pages. Page 6-6 remains unchanged. An explanation was added to this section regarding soil vapor measurements attained to estimate projected VOC recovery rates.
4. Replace Subsection 7.1, second bullet (page 7-1) with the enclosed page. A statement was added to clarify reference to Table 3-4 showing overall decline in VOC mass recovered per volume of groundwater with a slight increase in 1999.

If you have any questions or comments, please feel free to call me at (864) 234-9363.

Sincerely,

RMT, Inc.



Steve W. Webb, Ph.D., P.E.
Project Manager

Attachments:

cc: Medley Farms Distribution List



Section 1

Introduction

1.1 Background

Groundwater and soil remediation activities were initiated at the Medley Farm NPL Site in March 1995. Treatment system startup followed final inspection and approval of the constructed systems by USEPA Region IV and SC DHEC officials. Startup of the Medley Farm NPL Site treatment system signaled the culmination of more than 12 years of site investigation, detailed design, and construction work. As a result of these efforts, the treatment systems have been effectively removing VOCs from affected groundwater and soils at the site for almost 5 years.

Groundwater is extracted from the subsurface of the Medley Farm NPL Site by a system of 11 jet-pump recovery wells. VOCs are removed from the water by a low-profile air stripper. Treated groundwater is discharged to Jones Creek through a National Pollutant Discharge Elimination System (NPDES)-permitted outfall. Volatile compounds that are stripped from the groundwater are discharged directly to the atmosphere.

VOCs present in affected vadose-zone soils were initially removed through a series of eight SVE wells. To enhance the recovery of soil vapors from the subsurface, eight additional wells, which were originally installed as soil vapor monitoring wells, were connected to the vacuum extraction system in 1998. A rotary-lobe vacuum pump is used to extract the VOC-affected soil gas, which is then discharged directly to the atmosphere. Details regarding each of these treatment systems are available in the *Medley Farm Site Final Design Report* (RMT, August 1993).

Remedial goals were established for 11 VOCs in soil and 15 VOCs in groundwater in the 1993 PSVP. Of the 15 constituents of concern (COCs) originally identified in groundwater, only four are presently identified in groundwater routinely at concentrations of concern. These four VOCs of concern at the Site are as follows: 1,1-dichloroethene (1,1-DCE), TCE, 1,2-dichloroethane (1,2-DCA), and PCE. These compounds are regulated as air toxics by the State of South Carolina. The SVE unit and air stripper are the only pieces of equipment that emit VOCs to the atmosphere at the Medley Farm NPL Site. The mass of the VOCs emitted to the atmosphere from the stripper and SVE unit fall well below the *de minimis* threshold of SC Regulation R.61-62.1. This was confirmed by SC DHEC based on a stack test performed in 1995, shortly after the system went on-line. Therefore, the Medley Farm NPL Site is exempt from State air permitting requirements.

A spike was not observed after the first system restart of 1999; however, a spike in VOC recovery did occur after the second 1999 system restart. The vapor samples collected after the first system restart were collected shortly after restart and represent soil vapor obtained from close proximity to the well. The later sampling event was taken several hours after restart, and represents soil vapor that had traveled some distance through the subsurface to reach the well. These results are an indicator that VOCs are still present in the soils within Area 3.

Table 6-1 shows that significant amounts (greater than 100 pounds) of VOCs were recovered from VE-301, VE-302, VE-303, VM-301D, and VM-304S. The most VOCs were recovered from VE-303 (361 pounds). Graphs of historic VOC recovery rates (PCE, TCE, and total VOCs) are shown in Appendix H-10 through H-14. These graphs show the three parameters (PCE, TCE, and total VOCs) trend together and that current recovery rates are much lower than the historical maximums. The current VOC recovery rate at Area 3 (based on September 1999 sampling data) is estimated at 1.3 pounds per day. Using this recovery rate, the SVE system, as currently configured, at most would reasonably recover an additional 400 pounds of VOCs by 2001. However, the long-term and sustainable VOC recovery rate will likely be much lower because the 1.3 pounds of VOCs per day measured in 1999 was based on vapor sampling that occurred following a period of system downtime.

6.2 Confirmation Soil Sampling and Analysis

To assess the performance of the SVE system, seven soil borings were drilled in 1999. The borings were drilled by means of hollow stem augers to a total depth ranging from 89 feet to 115 feet below ground surface. Split spoon soil samples were collected at 5-foot intervals and four to six samples from each borehole were submitted to EnChem Laboratories for analysis of TCL VOCs. Soil samples for VOC analysis were collected and preserved in accordance with SW-846, Method 5035 using an Encore™ sampler. Data validation was performed in accordance with CLP protocol.

In SVE Area 1, no VOCs above PSVP remediation goals were detected in soil samples collected from PSVB-1-1 and PSVB-1-2. Five soil samples were collected for laboratory analysis from PSVB-1-1 at depths ranging from 22 feet to 78 feet below ground surface. Four soil samples were collected for laboratory analysis from PSVB-1-2 at depths ranging from 22 feet to 70 feet below ground surface. Borings PSVB-1-1 and PSVB-1-2 intercepted the top of the water table at approximately 80 feet below ground surface with minimal photoionization detector (PID) readings and only traces of detectable VOCs.

In SVE Area 2, elevated VOC concentrations from PSVB-2-1 were detected only at an interval 5 feet to 7 feet below ground surface. PCE and TCE were detected at this interval with concentrations of 62.0 mg/kg and 1.2 mg/kg, respectively. Six samples were collected from PSVB-2-1 at depths ranging from 5 feet below ground surface to 63-feet below ground surface. The 5-foot to 7-foot soil sample interval bottomed in native saprolitic soils, indicating that the interval is only a thin unit not addressed during the site removal action conducted prior to the remedial investigation phase. This layer is the only potential issue associated with Area 2, where vadose zone remediation is otherwise complete. Of the eleven soil samples collected from the soil borings PSVP-2-1 and PSVP-2-2, only the one sample collected from 5 to 7 feet showed any levels of constituents above PSVP standards.

In Area 3, elevated VOC concentrations of 1,2-DCA were detected above remedial goals in PSVB-3-3, PSVB-3-4 and PSVB-3-5. The highest concentration of 1,2-DCA in was detected in PSVB-3-3 at a depth of 55 feet below ground surface reported as 0.84 mg/kg. Three samples collected below this interval yielded concentrations decreasing with depth. Five soil samples were collected from soil boring PSVB-3-4. Elevated concentrations of 1,2-DCA (7.6 mg/kg to 78 mg/kg) were reported in four discrete soil samples collected from the 40-foot to 76.5-foot depth interval with a maximum concentration of 78 mg/kg at 65-feet to 67-feet below ground surface. Concentrations of 1,2-DCA decreased with depth from 78 mg/kg at the 65-foot to 67-foot interval, to 57 mg/kg at the 75-foot to 76.5-foot interval, to 0.45 mg/kg at the 82-foot to 84-foot depth interval.

Elevated levels of 1,2-DCA were also reported in boring PSVB-3-5. Five soil samples were collected at boring PSVB-3-5 at depths ranging from 20 feet to 83 feet below ground surface. Analytical data show soil samples collected at 55 feet to 57 feet and 71 feet to 73 feet below ground surface had 1,2-DCA concentrations exceeding remedial goals. 1,2-DCA concentrations at the 55-foot to 57-foot interval were reported as 0.13 mg/kg and concentrations at the 71-foot to 73-foot interval were reported as 0.16 mg/kg.

The highest concentration of 1,2-DCA observed in soil boring PSVB-3-4 at a depth interval of 75-foot to 76.5-foot and soil boring PSVB-3-5 at a depth interval of 71-foot to 73-foot corresponds to the level of 1995 prepumping water table. Thus, the area with the highest residual 1,2-DCA concentration in soil is at or above the level of the original water table and below the potential effective depth of the present SVE system. This deeper interval is the focus of additional remediation in SVE Area 3 as proposed in this report. Based on these results, RMT reached the following conclusions:

- Soil remediation in SVE Area 1 is complete. No VOCs above PSVP remediation goals were detected in the two PSVB borings drilled in 1999. Only traces of detectable VOCs were found.

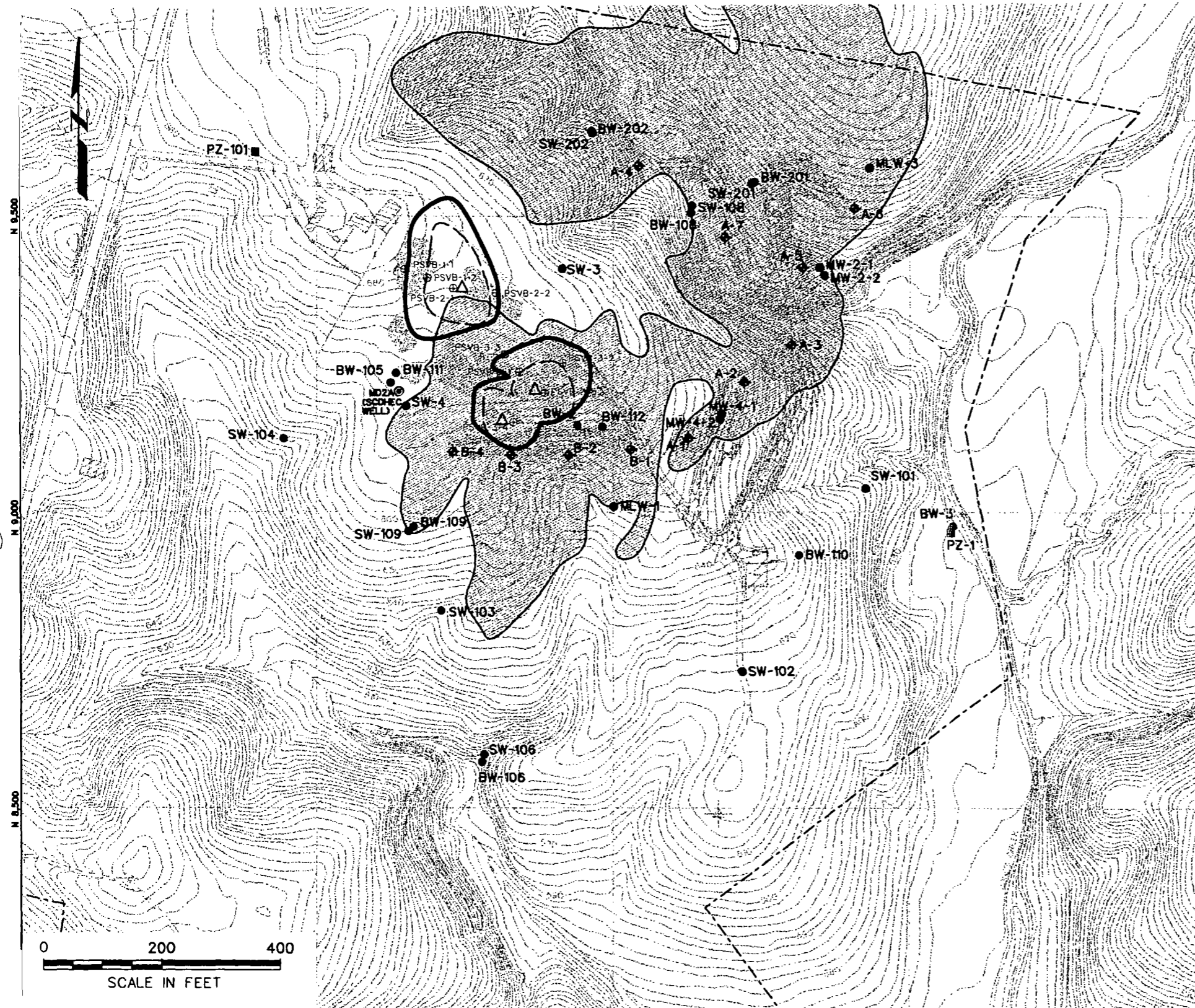
Section 7

Conclusions and Recommendations

7.1 Conclusions

The following conclusions and recommendations are offered as a result of the data evaluation provided in the previous sections.

- The groundwater remediation system has recovered and treated approximately 63.5 million gallons of water. This has resulted in the removal of more than 200 pounds of VOCs from the groundwater since system startup in December 1995.
- The ratio of VOC mass recovery per volume of groundwater recovered declined each year until 1999 when a slight increase was observed. The ratio of VOC mass recovery went from a high of 5.11 pounds of VOCs per million gallons (lb./Mgal) of groundwater recovered in 1995 to a value of 1.67 lb./Mgal in 1998 to 1.78 lb./Mgal recovered in 1999. The overall ratio of VOCs recovered since system startup has averaged approximately 3.67 lb./Mgal.
- The performance of the groundwater treatment system continues to reduce VOC concentrations in the effluent wells below NPDES requirements and achieve the objectives of the remedial design.
- Groundwater data collected from the SVE treatment area indicates that while VOC concentrations have decreased in nearby monitoring and recovery wells, VOC concentrations in the former source area remain above groundwater remediation goals.
- The observed distribution of VOCs in the groundwater and changes over time, as defined by groundwater capture simulations using a transient groundwater flow model, indicate continued operation of the existing groundwater recovery will not facilitate timely recovery of VOCs in the former source area. Additional treatment measures are therefore recommended to enhance site remediation and expedite cleanup of the affected groundwater.
- The SVE treatment system has recovered approximately 2,000 pounds of VOCs from vadose zone soils since startup of the system in March 1995. Using the most recently measured recovery rate of 1.3 pounds of VOCs per day, the SVE system, as currently configured, at most would reasonably recover an additional 400 pounds of VOCs by 2001. The long-term and sustainable VOC recovery rate will likely be much lower because the 1.3 pounds of VOCs per day measured in 1999 was based on vapor sampling that occurred following a period of system downtime.
- Soil and vapor sampling data from Area 1 indicate that soil clean up objectives have been achieved in SVE Area 1. Soil remediation activities in SVE Area 1 have achieved all limits set forth in the PSVP. No VOCs above PSVP remediation goals were detected in the two confirmation soil borings drilled in 1999. During 1999, no VOCs were detected in vapor measurements collected from SVE Area 1. Therefore, VE and VM wells in SVE Area 1 were turned off in November 1999.



LEGEND



















-  PROPOSED DUAL PHASE SVE GROUNDWATER F
-  SW-109 SAPROLITE MONITORING WELL
-  BW-201 TRANSITION ZONE MONITORING WELL
-  BW-105 BEDROCK MONITORING WELL
-  MLW-1 MULTI-LEVEL MONITORING WELL
-  A-4 RECOVERY WELL (SYSTEM A)
-  B-3 RECOVERY WELL (SYSTEM B)
-  PZ-1 PIEZOMETER
-  660 TOPOGRAPHIC INDEX CONTOUR
-  PROPERTY LINE
-  FENCE
-  STREAM
-  UNIMPROVED ROADS
-  BUILDING
-  MODELED EXTENT OF GROUND WATER CAPTURE.
-  FORMER DRUM DISPOSAL AREA OR LAGOON
-  1 YEAR GROUNDWATER CAPTURE IN SO
-  2 YEAR GROUNDWATER CAPTURE IN S

FIGURE 5-4

PROPOSED RECOVER
AND RESULTING CO